



Techniques for Making Children's Artificial Eyes

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Abstract

This case study presents a novel technique for creating custom-made artificial eyes that incorporate children's favourite characters. By using character-themed designs, these prostheses aim to foster a healthy relationship between children and their prosthetic eyes, enhancing their self-esteem, confidence, and overall well-being. The approach not only addresses the medical needs of young patients but also acknowledges the emotional and psychological aspects of wearing an artificial eye, making it a more personalized and empowering experience.

Keywords: Evisceration; Microphthalmia, Prosthetic Eyes; Artificial Eyes

Clinical Case

The study involved several pediatric patients who participated in trials for custom character-themed artificial eyes. These prostheses were designed to be aesthetically pleasing while also incorporating elements that resonate with the children, such as their favorite animated characters or superheroes. The children in the study were diagnosed with conditions like evisceration and microphthalmia, which required the use of prosthetic eyes to restore the appearance of the eye and improve their quality of life. All participants received a character eye as well as an artificial eye that matched their healthy eye. This technique followed a similar processing technique by Pine KR, et al. [1].

Treatment Plan

The treatment plan focused on designing and implementing techniques to fabricate custom-made artificial eyes that resonate with personal preferences. The primary objective was to encourage a positive relationship between the wearers and their prostheses, thus boosting self-esteem and confidence in social settings. By making the artificial

eyes appealing and reflective of individual interests, wearers would be more inclined to use them and feel proud of their unique prosthesis.

Goals of the Treatment Plan

- Personalization: Integrate character themes that resonate with the wearer's personality and interests to create a sense of ownership and pride.
- Aesthetic Appeal: Ensure that the prosthesis is not only functional but also visually appealing, closely resembling a natural eye while incorporating character elements.
- Comfort and Fit: Prioritize comfort by ensuring a precise fit, allowing for easy insertion and removal.
- Psychological Impact: Address the emotional needs of the wearers by turning the prosthesis into a fun and positive aspect of their identity, improving confidence, and encouraging patients to positively engage with their artificial eye.

Method Technical Approach

Molding and Fabrication

Custom Moulding

- The process began with taking a precise impression of the eye socket to create a custom mold. This mold served as the foundation for crafting both the standard artificial eye and the character-themed prosthesis.
- Advanced digital imaging techniques were employed to capture the unique contours of the eye socket, ensuring a perfect fit.

Wax Model Creation

- A wax model of the artificial eye was sculpted based on the custom mold. This step allowed for adjustments to be made to the size and shape before finalizing the design.
- The wax model was carefully crafted to include features of the desired character, ensuring that the final product would be both functional and visually appealing.

Plaster Processing

- Once the wax model was perfected, it was processed into plaster to create a durable mold for the final prosthetic eye.
- This mold would be used to produce both the standard prosthetic eye and the character-themed version.

Design Selection

- Each wearer selected their favorite character to be integrated into the prosthetic eye design. Designs were customized to include subtle elements that aligned with the character, such as colors, patterns, or symbols.
- For example, a prosthetic eye could feature a delicate unicorn motif or incorporate Spider-Man's signature red and blue colors with a subtle web design.

Cornea Button Creation

- Custom cornea buttons were crafted for each prosthetic eye. For glittery designs, a mixture of glitter and clear orthodontic resin was used to add sparkle and vibrancy.
- The back of the cornea unit was sanded to enhance mechanical retention. The glitter and resin mix was applied using the salt-and-pepper technique, ensuring an even distribution of glitter particles.

Character Painting

- The character designs were meticulously painted onto the surface of the scleral acrylic using the Monopoly technique with dry pigments. This technique ensured vivid colors and precise detailing.
- The painted surface was left to dry for 48 hours, allowing

the colors to set and adhere firmly to the acrylic surface.

Acrylic Processing

- All artificial eyes were processed into clear acrylic to ensure durability and optical clarity.
- The prostheses were polished to achieve a natural, glossy finish that closely resembled a real eye.

Quality Checks

- Each prosthetic eye underwent rigorous quality checks to ensure it met the highest standards of safety, comfort, and aesthetics.
- The final prostheses were disinfected thoroughly before being supplied.

Fitting and Adjustment

- The final fitting involved placing the prosthetic eye in the socket to ensure a comfortable fit and natural appearance.
- Adjustments were made as needed to optimize fit, ensuring ease of insertion and removal.

Result

The introduction of custom-made character-themed artificial eyes had a profound impact on the wearers involved in the study. Feedback highlighted significant improvements in self-esteem, social interactions, and overall satisfaction with the prosthesis (Figure 1).

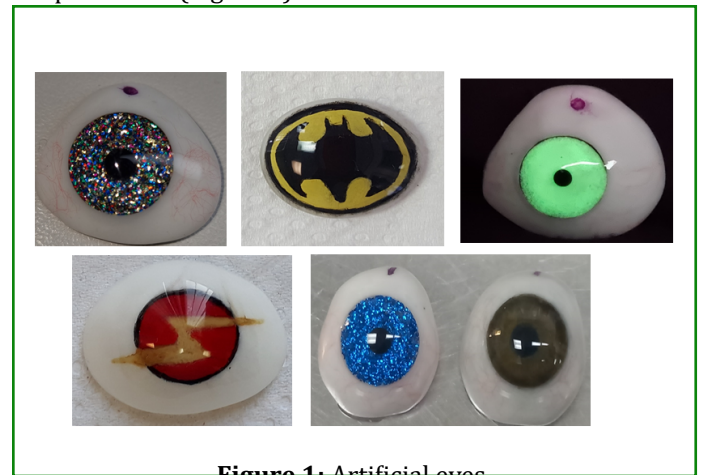


Figure 1: Artificial eyes.

Positive Feedback

- **Increased Confidence:** Caregivers reported noticeable improvements in the wearers' confidence levels. The prostheses were seen as empowering, allowing them to embrace their unique identities.
- **Positive Social Interactions:** Observers noted that

the wearers were more eager to participate in social activities and were less anxious about their appearance. The character-themed eyes served as conversation starters, making it easier to engage with others.

- **Reduced Bullying:** Caregivers noted a decrease in bullying incidents. The character-themed prostheses were often viewed as “cool” by peers, reducing negative attention and fostering curiosity and admiration instead.

Overall Success and Recommendations

The success rate of the character-themed artificial eyes was remarkable, with all participants reporting enhanced

confidence and comfort. The innovative approach of personalizing prosthetic eyes by incorporating elements of the wearer’s favourite characters proved to be a transformative experience. By addressing both the physical and emotional needs, this technique has paved the way for more personalized and meaningful prosthetic solutions in care.

References

1. Pine KR, Sloan BH, Jacobs RJ (2015) Making and fitting prosthetic eyes. *Clinical Ocular Prosthetics*, pp: 65-78.